

**Changkat Changi Secondary School**  
**Physics Department**

**Unit 5: Turning effects of forces**

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

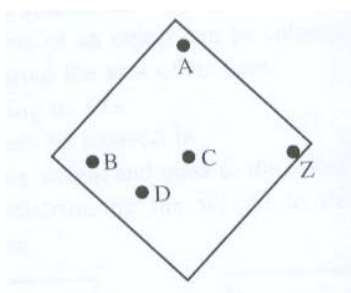
**Worksheet 5.3**

**Section A—Multiple Choice Questions**

1. The weight of an object always acts through its

- A** base.                      **B** geometric centre.    **C** centre of gravity.    **D** whole body.                      (    )

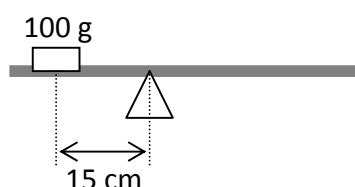
2. If the lamina is dangled freely at point Z, where would the centre of gravity of the lamina be?



(    )

3. A 300 g light rod is balanced by a 100 g mass placed 15 cm from a pivot as shown.

How far from the pivot is the center of gravity of the rod ?



- A** 5 cm                      **C** 10 cm  
**B** 15 cm                      **D** 20 cm

(    )

4. The stability of an object depends on

- A** its weight.  
**B** its base area only.  
**C** the location of its centre of gravity only.  
**D** its base area and the location of its centre of gravity.

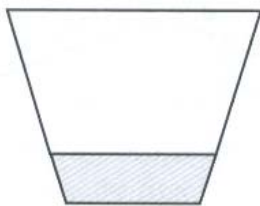
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5. What design makes an object very stable?

- |          | Position of centre of mass | Size of base |
|----------|----------------------------|--------------|
| <b>A</b> | high                       | small        |
| <b>B</b> | high                       | large        |
| <b>C</b> | low                        | small        |
| <b>D</b> | low                        | large        |

(    )

6. The flower pot is filled with sand at the bottom. How does this increase its stability?

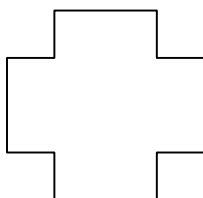
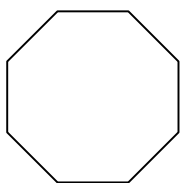


- A By adding to its weight.
- B By unequally distributing the weight.
- C By increasing the mass.
- D By lowering the centre of gravity.

(      )

### B. Structured Questions

7. Draw the centre of gravity of each of the two cut out shapes below.

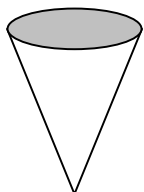


8. (a) Define centre of gravity.

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(b) What state of equilibrium is the cone in? Explain your answer.



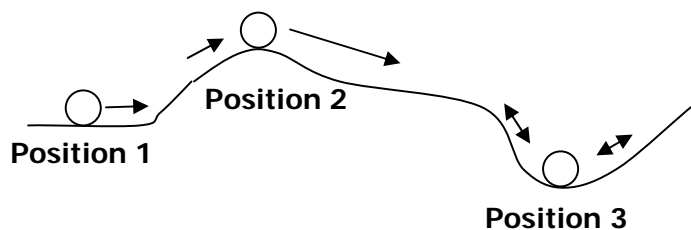
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9. If you are supplied with a plane mirror (Diagram A), a concave mirror (Diagram B), a convex mirror (Diagram C) and three small rubber balls, indicate in the diagrams below where you would place the balls to illustrate the three types of equilibrium – stable, unstable and neutral.



- (a) Diagram A shows \_\_\_\_\_ equilibrium.  
 (b) Diagram B shows \_\_\_\_\_ equilibrium.  
 (c) Diagram C shows \_\_\_\_\_ equilibrium.
10. A ball lies stationary at position 1 on level ground. A passerby gives it a kick and it rolls up a little hill. It slows down and almost seemed to stop at position 2 the highest point of the little hill. Then it rolled down to the valley and went up and down the sides before finally coming to a halt at position 3, the lowest part of the valley.



Write down the state of equilibrium at position 1, position 2 and position 3. Explain your answer.

Position 1-- \_\_\_\_\_

Position 2-- \_\_\_\_\_

Position 3-- \_\_\_\_\_